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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,537

08/25/2006

Damian Fiolka

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EXAMINER

MATHEWS, ALAN A

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,537	<b>Applicant(s)</b> FIOLKA ET AL.	
	<b>Examiner</b> ALAN A. MATHEWS	<b>Art Unit</b> 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 37-71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-62 and 64-66 is/are rejected.
- 7) ☒ Claim(s) 63 and 67-71 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/25/06 &amp; 9/29/06</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because the Abstract is not on a separate page. Correction is required. See MPEP § 608.01(b).

### *Claim Rejections - 35 USC § 112*

1. Claims 37-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 37, line 2, the phrase “**in particular for**”, which is part of the recitation “**in particular for a projection objective in semiconductor lithography**” renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). This indefiniteness rejection would be withdrawn if Applicant positively recited the projection objective in a semiconductor lithography apparatus or at least delete “in particular”. With respect to claim 40, “wherein **the following** holds true for the width  $s$ :  $0.05 < s < 1\text{mm}$ ” is indefinite. What does “**the following**” refer to? In claim 46, “in a ratio of 1:3 to 2:3” is confusing. Since “1:3” is a ratio, what is “2:3”? Is Applicant trying to recite a range of ratios?

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 37-40, 43-45, 47-51, 60, 61, and 64 - 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Muraki et al. (U.S. Patent 5,463,497, which is cited as an X reference in a Search Report). Muraki et al. discloses in figures 8 and 9A-9C and column 14, lines 1-67, column 15, and column 16, a laser 11 and a resonator 31 for a projection apparatus for a semiconductor lithography apparatus. A first partial beam impinges on the surface of the resonator and is partially reflected and a second partial beam enters the resonator body and emerges from the resonator body again after a plurality of total reflections. Column 15, line 11 discloses recombining the divided laser beams. Element 111 is a phase plate. Figures 17A, 17B, 17C, 18, and 19A and column 20, lines 65-67, and column 21, disclose the use of a phase plate 111 having different thicknesses (112a and 112b and figure 19A). Figure 9B discloses the use of a prism 14 and figure 17C discloses the use of a prism 15. With respect to claim 39 and 61, column 21, lines 25-31 disclose the phase difference between a light passing through the upper part 112A and the light passing through the lower part 112b. With respect to claims 43 and 64, figure 14 discloses use of the reversing system 31 in figure 9B **in duplication** (see column 19, lines 43-50). This would be a prism system having

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at least 5 corners. With respect to claims 47, 48, and 67, the claims do not recite that the wavelengths of the laser beam are actually at 157 nm or less; and therefore, at wavelengths of 157 nm or more, the resonator body does not have to be made of calcium fluoride. Claims 47 and 66 appear to be based on a condition that may not be present in apparatus. With respect to claim 49, "can be rotated" is not a structural limitation in the claim. The laser beam in Muraki et al "can be" rotated or is capable of being rotated. With respect to claim 60, figure 1 discloses an illumination system, an illumination plane with a mask R and a projection objective 24. Figure 8 also discloses an illumination system with light from element 21 illuminating a reticle or mask (see column 14, lines 1-25).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 41 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraki et al. as applied to claims 1 and 25 above, and further in view of the article by Wang et al. entitled "Speckle reduction in laser projection systems by diffractive optical elements" (cited in one of applicant's IDSs). Muraki et al. discloses the

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invention except for disclosing that the phase plate is formed as a diffractive optical element (DOE). The article by Wang et al. discloses on page 14/18 (upper right-hand corner) of the faxed copy having phase and amplitude modulation introduced by use of a diffractive optical element (DOE). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Muraki et al. with a diffractive optical element (DOE) in view of the article by Wang et al. for the purpose reducing speckle and improving the functions or the optics of the phase plate and thus making a better final product.

***Allowable Subject Matter***

6. Claims 63 and 67-71 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 42 and 52-59 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The reasons for the indicated allowability of the claims are as follows:

The prior art does not disclose or suggest a diffusing screen is provided as the phase plate in combination with all the other elements recited in the parent claims to each of dependent claim 42 and dependent claim 63.

The prior art does not disclose or suggest wherein the prism is formed in asymmetrical fashion in combination with all the other elements recited in the parent claim to each of dependent claim 52 and dependent claim 67.

The prior art does not disclose or suggest wherein the position of the centroid beam of the laser beam impinging on the resonator body is eccentric in combination with all the other elements recited in the parent claim to each of dependent claim 54 and dependent claim 68.

The prior art does not disclose or suggest wherein the resonator body is formed in asymmetrical fashion, and in that the centroid beam of the laser beam impinges eccentrically on the resonator body in combination with all the other elements recited in the parent claim to dependent claim 55.

The prior art does not disclose or suggest wherein the surface of the resonator body on which the laser beam impinges is provided with a splitter layer in such a way that it influences the entrance angle of the partial beam entering the resonator body in combination with all the other elements recited in the parent claim to each of dependent claim 56 and dependent claim 69.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents cited in the PTO-1449s are cited for the same reasons they were cited in Applicant's IDSs. The European patent EP 1 107 039 and the corresponding patent family member U.S. 6,512,780 are cited for the same reasons they were cited in Applicant's specification. A machine translation of DE 195 08 754 A1 (which was cited in applicant's IDS) is provided (**which appears to only be a partial translation**). The Examiner is in the process of requesting a complete, formal translation of DE 195 08 754 A1, which will take several weeks.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN A. MATHEWS whose telephone number is (571)272-2123. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571) 272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan A. Mathews/  
Primary Examiner  
Art Unit 2851

AM